

# Junior Meteorologist Program

2<sup>nd</sup> Grade Classroom and Field Program

Teacher's Version

By Kimberly Lewis

Revised 11/8/99 and 1/10/01

Grade: Second

Subject: Observing and recording the weather

Theme: The Mojave Desert is characterized by extreme temperatures, little rain, and strong winds. By measuring and recording the weather conditions on a daily basis trends can be identified. These trends effect plants, humans and other desert animals.

Goal: Students will gain a better understanding of weather conditions. They will record, observe, and describe the effects of weather.

Objectives: Students will be able to record the daily temperature.  
Students will be able to observe and record changing conditions.  
Students will describe the weather at different times of the year.  
Students will describe at least one way changing weather conditions affect humans.

Curriculum: (2)1.1 Observe, record, and describe the effects of weather.

Background:

An area is designated a desert based on the amount of precipitation and the rate of evaporation in an area. Red Rock Canyon National Conservation Area is located within the Mojave Desert. The area receives approximately 6 inches of rain per year (the Las Vegas valley receives approximately 4 inches per year). The rate of evaporation exceeds 6 inches per year.

This dry environment of the Mojave Desert is classified as a rain shadow desert. A rain shadow desert is created when mountain ranges lie parallel to moist, coastal areas. Winds moving inland cool as air is forced to rise over the mountains. Clouds form and carried moisture falls on slopes facing the winds. When the winds move over the crest and down the far side, they are very dry. Descending air also makes it hard for additional clouds and precipitation to form. Without another source of moisture, rain shadow deserts are formed on the far side of these mountain ranges.

The Mojave Desert lies East of the Sierra Nevada range in California. Moisture and winds from the Pacific Ocean move east and the moisture falls on the mountains. This results in dry wind and air descending on the Vegas area including Red Rock Canyon.

Key Points:

Weather conditions are constantly changing. By recording and observing the weather we can follow the trends. The trends are important to animals, plants, and humans.

Vocabulary:

anemometer: device to measure wind speed

meteorologist: someone who studies the science of weather and weather forecasting.

psychrometer: a device used to measure the amount of moisture in the air.

rain gauge: an instrument used to measure the amount of rain that has fallen in a 24 hour period.

thermometer: an instrument used to measure the temperature.

meteorologist: a person that studies the science of the atmosphere, especially weather and weather conditions

#### Classroom Visit (Reading a Thermometer):

While the ranger is at your classroom they will hold a discussion about the weather in Las Vegas. They will also teach the students how to read a thermometer. The first set of activities will take place inside the classroom. Once the students understand how to read a thermometer the group will go outside to the playground to take the temperature.

#### Post-site Activities for Classroom Visit:

There are two activities for the students to do before they visit Red Rock. It is best if both of the activities are done for the entire month. One activity is measuring the daily temperature. The other is making observations about weather conditions.

On a daily basis have the students measure the temperature and record it on the chart/spreadsheet provided.

On a daily basis the students also make observations about weather conditions. They should note/draw if it is sunny, cloudy, rainy, etc. on the calendar provided. The completed calendars will be used for a post-site activity.

Do both of these activities for the entire month that your group is visiting Red Rock Canyon. Included in this packet is the calendar and the spread sheet for the temperature readings. Before they are used you will need to fill in the month and dates. Make sure each student has a copy of each. On a daily basis you or a student will need to fax or call the Visitor Center with your temperature readings. We will display the data in the Visitor Center for the month. When your students visit Red Rock Canyon they will get a chance to see the display and hopefully take pride in their work. The visitor center has thermometers you can check out for the month.

#### Activity at the Visitor Center (Scorching Hot or Freezing Cold):

While at the visitor center the students will be doing a number of activities. First the ranger will engage the students in a discussion about how to read a thermometer. Students will also learn how wind, moisture, and rain are measured. Students will explore the weather station we have at Red Rock Canyon and participate in activities that investigate how weather effects plants, animals, and people.

#### Post-site Activity:

This activity is designed to help students visualize trends in the weather while working on their math and graphing skills. If you did the pre-site activity all your students should have a calendar with a picture in each square. At the end of the month cut the calendar into its individual days. Glue the days that show similar weather in columns to produce a bar graph. Remind the students that bar graphs have titles and both axes are labeled. If you choose to send the completed graphs to us we will display them in the visitor center.

#### References:

Mojave Desert Discovery Book  
Red Rock Canyon Home Page-  
[www.redrockcanyon.blm.gov](http://www.redrockcanyon.blm.gov)  
National Weather Service-  
[www.nws.noaa.gov](http://www.nws.noaa.gov)  
National Weather Service Western Region-  
[www.wrh.noaa.gov](http://www.wrh.noaa.gov)  
Nate Tannenbaum's Weather (local weather forecast)-  
[www.kvbc.com](http://www.kvbc.com)  
Remote Automatic Weather Station (RAWS) (Current readings from our weather station at the Visitor Center)-  
[www.boi.noaa.gov/FWXEXP/RAWS/SUMMARY/alphabet.NV.html](http://www.boi.noaa.gov/FWXEXP/RAWS/SUMMARY/alphabet.NV.html)



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The Mojave Desert lies East of the Sierra Nevada range in California. Moisture and winds from the Pacific Ocean move east and the moisture falls on the mountains. This results in dry wind and air descending on the Vegas area including Red Rock Canyon.

**Key Points:**

Weather conditions are constantly changing. By recording and observing the weather we can follow the trends. The trends are important to animals, plants, and humans.

**Vocabulary:** anemometer: device to measure wind speed  
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psychrometer: a device used to measure the amount of moisture in the air.  
rain gauge: an instrument used to measure the amount of rain that has fallen in a 24 hour period.  
thermometer: an instrument used to measure the temperature.  
meteorologist: a person that studies science of the atmosphere, especially weather and

weather conditions

**Activities:**

The activities for this program take place over one month. The first activities are when a ranger goes to the school classroom. This should be done at the very beginning of the month. During the month the students will call in a temperature report. At the end of the month the class will visit Red Rock.

**Supplies:**

Temperature recording spreadsheet  
Weather observation calendar  
Thermometers  
Rain shadow map  
Map of California and Nevada  
Laminated "Giant Thermometers"  
Red dry erase marker

**Activity Specifics:**

WHAT IS THE WEATHER LIKE IN VEGAS

5 minutes

The Mojave Desert is a Rain Shadow Desert. Rain shadow deserts are created when mountain ranges lie parallel to moist, coastal areas. Winds moving inland cool as air is forced to rise over the mountains. Clouds form and the carried moisture falls on slopes facing the winds. When the winds move over the crest and down the far side, they are very dry. Descending air also makes it hard for additional clouds and precipitation to form. Without another source of moisture, rain shadow deserts are formed on the far side of these mountain ranges. Use the rain shadow desert chart to explain this. Ask the if they know what mountains are between us and the ocean. Show them the map of California.

LET'S TAKE THE TEMPERATURE!

Hand out thermometers. Depending on how many kids and thermometers they may have to share. Explain that it takes a few minutes for thermometers to adjust (3-5 minutes). Have them take the temperature in the classroom. Write it on the board. Take the kids outside to their playground or something. Tell them to hold the thermometer about 3 feet above the ground. Wait approximately 5 minutes. Take the reading. Go back inside. Explain that they are going to do this everyday for the current month. Show them the display and explain that they need to call or fax in the information everyday. We will fill in the chart. Emphasize for scientific purposes they should try and take the temperature at the same time each day.

GOOD-BYE!!

Tell them we'll see them when they come out to Red Rock. If they want to come out to the park before hand with their family/neighbors/etc their display will be in the visitor center.

Rangers will visit the classroom at the very beginning of the month. They will hold a discussion about why the weather is like it is in Las Vegas. They will also teach the students how to read thermometers. The first set of activities will take place inside the classroom. Once the students understand how to read a thermometer the group will go outside to the playground.

**Post-site Activities for Classroom Visit:**

There are two activities for the students to do before they visit Red Rock. It is best if both of the activities are done for the entire month. One activity is measuring the daily temperature. The other is making observations about weather conditions.

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Do both of these activities for the entire month that your group is visiting Red Rock Canyon. Included in this packet is the calendar and the spread sheet for the temperature readings. Before they are used you will need to fill in the month and dates. Make sure each student has a copy of each. On a daily basis you or a student will need to fax or call the Visitor Center with your temperature readings. We will display the data in the Visitor Center for the month. When your students visit Red Rock Canyon they will get a chance to see the display and hopefully take pride in their work. The visitor center has thermometers you can check out for the month.

#### **Activities throughout the month:**

Each weekday a student or teacher should call the visitor center. When they do record their temperature reading on the display board. Also record the current temperature at the visitor center. Put the display somewhere in the visitor center. The far left side of the counter with the brochures works well.

#### **Activities at the Visitor Center:**

WHAT IS THE WEATHER LIKE IN LAS VEGAS? Discussion, 5 minutes

Ask the students to describe the weather in the Mojave Desert. Clear skies, sunny and hot, highs 105 to 115 degrees Fahrenheit. That's what most people think but high seasonal temperatures and little rainfall (average 4 to 6 inches annually) are just two weather conditions that are found in the desert. A high rate of evaporation, wind and varying temperatures from night to day are also key factors that determine our weather. Cover these topics. Ask them how they find out what the weather is going to be like for the day. Look outside, watch the news or read the newspaper. Who puts together those weather reports? How do they get the information? Transition into being a junior meteorologist.

MEASURING THE TEMPERATURE Activity around the VC

35-45 minutes

Determine if the students know how to read a thermometer. If not teach them how to read one. Once they all know how to read a thermometer explain that they are going to become junior meteorologists. They are going to have to find the hottest and coldest spot around the Visitor Center. Divide them into groups of four-five. Give each group a thermometer, a clipboard with a recording sheet, and a pencil. Make sure each group has an adult. Show them the boundaries (they can go in the VC and see the lizard terrarium). Explain that they must stay on the trail. Give them 20 minutes. Make sure the adults know what time to bring the kids back. Walk around with different groups and make sure they are using the thermometers correctly. Prompt them to measure under the sand, maybe in a burrow, in the shade etc.

When they get back talk about the results. What was the hottest temperature? Why? What was the coldest temperature? Why? Where? How much did the temperature change? Who might this help? Lizards, desert tortoise? Humans in the visitor center temperature?

Ask them what other weather conditions are reported on the news. Wind, moisture in the air, rain etc. Show them an anemometer, a sling psychrometer, and a rain gauge.

WEATHER STATION

10 minutes

Have the group walk around the weather station. Ask the kids to describe it. Really stress that they use descriptive words (only describe what they see, not what they think the different components are/do). What is it made of? What shapes are on it? Then show them the rain gauge, anemometer, sling psychrometer, and thermometer. Do they

see anything that may do the same thing as these instruments. Go onto explain how the weather station works. Go back to picnic tables.

#### HOW DOES THE WEATHER EFFECT US?

35 minutes

Brain storm ideas about why we record weather conditions. Move the conversation to how the weather effects us -growing food, getting dressed in the morning. Also talk about how the weather is different at different times of the year (Use holidays as examples-school starting, Halloween, winter break, spring break, 4<sup>th</sup> of July).

Have the group get into their groups. Give each group a game card. Its time to play Weather Charades! Each group should choose a person to dress up. They should dress the person up in cloths that you would wear according to the information on your card. Have the parents help read the cards but not tell them what to put on!! When the groups are ready have one student come up front. Ask the group what the weather conditions may be like that day. Then ask them what holiday it may be around. Go through each group.

#### HOW DOES THE WEATHER EFFECT ANIMALS?

20 minutes

Go outside by Max's burrow. Talk about the Desert Tortoise hibernating. What happens when its too cold outside? What happens to the tortoise's body functions? What about the lizards? What temperature was their terrarium? What about polar bears? Different animals like different temperatures. They live in habitats where it is generally that temperature. When the seasons change they find ways of changing their activities to suit the weather.

#### CLOSING

5 minutes

Weather is a very important thing. It controls life for people, animals, and even plants. There are lots of professions that rely on weather forecasts on a daily basis. Can the students think of any? Firefighters, pilots, farmers. Tell them that if they like recording weather conditions or making daily observations they should think of being a meteorologist when they grow up. Or to think about how the weather could effect whatever it is they like doing!

#### **Post-site Activity:**

This activity is designed to help students visualize trends in the weather while working on their math and graphing skills. If you did the pre-site activity all your students should have a calendar with a picture in each square. At the end of the month cut the calendar into its individual days. Glue the days that show similar weather in columns to produce a bar graph. Remind the students that bar graphs have titles and both axes are labeled. If you choose to send the completed graphs to us we will display them in the visitor center.

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# **Junior Meteorologist Program-Classroom Ranger's Outline**

## **I. Introduction**

A. I'm a ranger from Red Rock: Do they know where that is?; What do ranger's do? Etc.

## **II. What is the weather like in Vegas?**

A. Rain shadow desert

## **III. Why is it important to know what the weather is going to be like on a daily basis.**

A. Why do we want to know if it is going to be warm, cold, windy etc.

B. Weather plays a big factor in the lives of many: farmers, fisherman, airplane pilots, us (example flash floods)

## **IV. Taking the temperature**

A. The first step of learning how to track the weather is to learn how to read a thermometer.

B. Teach the kids how to read a thermometer. Emphasis each little line stand for 2 degrees. Also address the difference between Fahrenheit and Celsius. They are going to be reading the "F" side of the thermometer.

C. Take the temperature in the classroom. Write it on the board.

D. Take the class outside and take the temperature.

E. Go back in the classroom and write the outside temperature on the board.



## **V. Temperature display board**

A. Show the class the display board. Explain that they need to take the temperature at the same time of day for the next month. They will call Red Rock and let us know what the temperature is then we will write it on the board.

B. Let them know when they come out for their field trip they will see the display in the VC. They will also get to see a real weather station and learn how it works.

## **VI. Closure**

A. Bah By! See you at the end of the month. They can come see the display with their families before that if they want.

Junior Meteorologist-Visitor Center  
RANGER'S COPY  
Outline

**I. What is the Weather Like in Vegas** **5 min.**

- A. What's the weather like?
- B. How do you find out what the weather is going to be like for the day?
- C. Who puts together the reports?
- D. How do they get the information?

**II. Measuring the Temperature** **35-40 min**

- A. Go over reading a thermometer
- B. Become junior meteorologists- explain activities  
Rules: 1. Must stay with chaperone; 2. No going in gift store; 3. No running and must stay on trail.
- C. When they get back talk about the hottest/coldest spot
- D. Ask them what other weather conditions are reported daily. Wind, moisture in air, rain. Show them the anemometer, a sling psychrometer, and the rain gauge.

**III. Weather Station** **10 min**

- A. Describe the station.

**IV. How does the weather effect us?** **35 minutes**

- A. Brainstorm why we record the weather- effects us growing food; getting dressed, etc.
- B. Weather is different at different times of the year-

holidays

C. Play game

**V. How does the weather effect animals?**

**20 min**

A. Go look at Max's burrow

B. Read book to add time

**VI. Closing**

**5 minutes**

A. Weather is an important thing. Lots of professions rely on weather. If it is something that interests them go the library and check out some books. There are also web pages that look at weather patterns, etc.